

Appl. No. 10/706,644  
Amendment and Response dated January 10, 2007  
Reply to Final Office Action of November 15, 2006

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**REMARKS**

Applicant acknowledges receipt of the Final Office Action dated November 15, 2006, in which Claims 42 and 67 were rejected as being unpatentable under 35 U.S.C. § 112, first paragraph; Claim 42 was rejected as being unpatentable over 35 U.S.C. § 112, second paragraph; Claims 56 and 59-65 were rejected based on 35 U.S.C. § 102(e) and § 103(a) as being unpatentable over U.S. Patent No. 6,702,960 by Schaddenhorst et al. (hereinafter '*Schaddenhorst*'), and Claims 57, 58, 66 and 67 were rejected based on 35 U.S.C. § 103(a) as being unpatentable over *Schaddenhorst* in view of Grieve et al. U.S. Patent No. 7,025,903 (hereinafter "*Grieve*"). The Examiner also indicated that the Application contained allowable subject in Claims 17-19, 21-27, 39-41, 44-48 and 50-55.

The undersigned was unclear about the status of Claim 43. The summary of the Office Action seemed to indicate that this claims was rejected, but there is no basis for such rejection on the Detailed Office Action. The undersigned called the Examiner on January 10, 2007 to get clarification on the status of this claim. The Examiner clarified during this phone conversation that Claim 43 is in allowable form.

Applicant would like to take this opportunity to thank the Examiner for his time and effort expended to examine the present application. Applicant appreciates the time the Examiner took to discuss the present application with the undersigned on January 10, 2007. During this phone conversation, Claims 42, 43, 56 and 67 were discussed. The undersigned believes that the present amendment and reply adopt the gist of the phone conversation with the Examiner, and should move this application into immediate condition for allowance.

However, if the Examiner believes that Applicant has not properly captured the patentable subject matter by clear and concise claim language but such claim language is readily apparent to the Examiner, Applicant would greatly appreciate any additional help that the Examiner is able to provide, and the Examiner is invited to call the undersigned at the phone number provided so that this Application may be processed for prompt allowance.

**Status of the claims**

Claims 17-19, 21-27, 39-48 & 50-67 are currently pending and under examination, in which Claim 17 is an independent claim from which Claims 18, 19, 21-27, 39-48, 50-55 and 66-67 depend, and Claim 56 is an independent claim from which Claims 57-65 depend.

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In this reply, Applicant amended Claims 17, 42, 56 and 59. All amendments to such claims are supported by the application as filed. Claim 17 was amended to remove the "at least" on line 4 of such claim as suggested by the Examiner on Page 4 of the Final Office Action dated November 15, 2006. Amendments to the other claims 42, 56 and 59 will be discussed later.

**Rejections based on 35 USC § 112 ¶ 2**

The Examiner rejected claim 42 under 35 U.S.C. § 112, second paragraph, as indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Claim 42 was amended in the previous Response dated October 24, 2006 to provide additional embodiments for the rhodium alloy composition. In order to address the indefiniteness rejection of the Final Office Action dated November 15, 2006, Applicant amended Claim 42 by removing "tantalum" and "niobium" from the Markush group listed in this claim. As such, Claim 42 requires that, in addition to rhodium and a second metal selected from the group consisting of ruthenium, rhenium, niobium, tantalum and mixtures thereof (as recited in Claim 17 from which Claim 42 depends), the rhodium alloy further comprises another "second *metal selected from the group consisting of tungsten, zirconium and mixtures thereof*". This amendment is supported by the application as filed, for example by at least paragraph [0030] on Page 8 of the specification as filed, as will be explained in the following section covering the rejection based on lack of descriptive support.

With the present amendment of Claim 42, it should be clear to one having ordinary skill in the art from the reading of such claim that the rhodium alloy comprises rhodium and *two* second metals selected from *non-overlapping* lists (i.e., one is selected from ruthenium, rhenium, niobium, tantalum, or mixtures thereof; while the other is selected from tungsten, zirconium or mixtures thereof).

Applicant thus believes that such amendment cures the indefiniteness issue and respectfully requests the Examiner to withdrawn the 35 U.S.C. § 112 ¶ 2 rejection on Claim 42.

**Rejections based on 35 U.S.C. § 112 ¶ 1**

The Examiner rejected Claims 42 and 67 under 35 U.S.C. § 112, first paragraph, as failing to

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comply with the written description requirement.

With respect to Claim 42, as stated in the previous response dated October 24, 2006, Applicant believes that currently-amended Claim 42 is supported by the application as filed, for example by at least the end of paragraph [0030] on Page 8 of the specification as originally filed (or paragraph [0031] on page 4 of the published application 2005-0261383 A1), which discloses:

“... Suitable metals for the rhodium alloy generally include but are not limited to Group VIII metals, as well as rhenium, tungsten, zirconium and mixtures thereof.  
 .... *The preferred metals are ruthenium, iridium, platinum, rhenium, tungsten, niobium, tantalum, zirconium and combinations thereof, most preferably ruthenium and iridium.*” (emphasis in *italic* added)

One having ordinary skill in the art reading such disclosure would understand that these listed metals (i.e., ruthenium, iridium, platinum, rhenium, tungsten, niobium, tantalum, and zirconium) as well as any combinations thereof are all suitable metals in the rhodium alloy composition. As such, there is adequate support for Claim 42 in the specification for the second metal in the rhodium alloy to contain a combination of two metals, each selected from non-overlapping sub-combinations of an originally disclosed list of metals (i.e., one being selected from ruthenium, rhenium, niobium, tantalum, or mixtures thereof; while the other being selected from tungsten, zirconium or mixtures thereof).

Applicant submits that such claim finds adequate descriptive support in the specification as filed, and thus respectfully requests the Examiner to withdrawn the 35 U.S.C. § 112 ¶ 1 rejection on Claim 42.

With respect to Claim 67, Applicant believes that Claim 67 is supported by the application as filed, for example by at least the limitation in original Claim 12 (now canceled as a non-elected claim by Applicant). Indeed, Claim 67 contains the verbatim recitation of the limitation recited in original Claim 12, which is as follows:

“... wherein said modified alumina is modified with a modifying agent selected from the group consisting of lanthanum, magnesium, aluminum, and combinations thereof.” [original Claim 12]

Moreover, there is additional written description support for Claim 67 in the disclosure of at least

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catalyst examples 1, 2, 5, 6, 8 and 9 and the performance data in Table 3, 5 and 6 and Figure 3. Catalyst examples 1 and 6 used an alumina modified with lanthanum. Catalyst examples 5, 8 and 9 used an alumina modified with magnesium. Additionally, catalyst example 2 used an alumina support modified with lanthanum and aluminum (see support Example B used in Ex. 2 described in paragraph [0037] on Page 10 of the specification). Applicant thus submits that Claim 67 finds adequate descriptive support in the specification as filed. Applicant thus respectfully requests the Examiner to withdraw the 35 U.S.C. § 112 ¶ 1 rejection on Claim 67.

#### Rejections over *Schaddenhorst*

Claims 56 & 59-65 were rejected under U.S.C. 102(e) as anticipated by, or in the alternative, under 35 U.S.C 103(a) as obvious over *Schaddenhorst*.

In this response, Claim 56 was amended on line 7 of such claim to remove "iridium" from the list of the second metal. The amendment of Claim 56 thus renders the scope of such claim narrower than that of allowable Claim 17, as it requires narrower catalyst compositions and additional performance criteria.

Other amendments to Claim 56 are to improve claim form. Applicant removed "at least" on line 14 of such claim as suggested by the Examiner on Page 4 of the Final Office Action dated November 15, 2006. Applicant further added "comprising a pressure" on line 14 of such claim to provide the same recitation as in Claim 17: "under operating conditions comprising a pressure greater than or equal to 2 atmospheres".

Additionally, since Claim 59 covered the same limitation as currently-amended Claim 56 with respect to the second metal composition in the rhodium alloy, Applicant amended Claim 59 by removing "ruthenium" from the list of the second metal to cover a narrowing embodiment of Claim 56 by requiring that the rhodium alloy comprises rhenium.

As stated in the previous Response dated October 24, 2006, *Schaddenhorst*, as a whole, teaches the use of a rhodium-iridium alloy catalyst for the catalytic partial oxidation. *Schaddenhorst* discloses two possible alloy compositions: 'AB' and 'ABC' where 'A' is rhodium; 'B' is iridium and 'C' is a cation selected from Groups IIA, IIIA, IIIB, IVA and IVB (preferably in the form of its oxide). Claim 56, as currently amended, recites a composition of type: 'AD', where 'A' is rhodium

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and 'D' comprises at least one element selected from ruthenium, rhenium, or mixtures thereof, which does not include iridium and does not belong to Groups IIA, IIIA, IIIB, IVA and IVB. Thus, the 'AD' combination in the present Claim 56 is not taught by the *Schaddenhorst* reference.

Furthermore, there is no suggestion nor motivation in *Schaddenhorst* that any of these second metal elements (i.e., ruthenium, rhenium, or mixtures thereof) could be used *in lieu of* iridium (to use the same analogy as above, replace 'B' with 'D') or could be used in addition to the rhodium-iridium combination (i.e., add 'D' to 'AB') while still achieving the required performance criteria as recited in Claim 56.

Thus, for at least the reasons stated above, Applicant believes that Claim 56 is patentable over *Schaddenhorst*, as *Schaddenhorst* does not teach or suggest each and every limitation in currently-amended Claim 56, which is required for a *prima facie* case of anticipation and obviousness (see MPEP 2131 and MPEP 2143.03), and furthermore there is no motivation to modify the teaching of *Schaddenhorst* to provide what is missing from *Schaddenhorst* with a reasonable expectation of success to arrive to the present Claim 56 (see MPEP 2143.01 and 2143.02).

As for the other rejected Claims 59-65 dependent upon independent Claim 56, each of Claims 59-65 carries all of the limitations from such patentable claim. As such Claims 59-65 are believed to be patentable over *Schaddenhorst* for at least the same reasons as Claim 56.

Thus, Applicant respectfully requests the Examiner to withdrawn the anticipatory rejection on Claims 56 & 59-65 over *Schaddenhors* and solicits their immediate allowance.

#### Rejections over *Schaddenhorst* in view of *Grieve*

Claims 57, 58, 66, and 67 were rejected under 35 U.S.C 103(a) as obvious over *Schaddenhorst* in view of *Grieve*. The rejection is respectfully traversed.

The Examiner has used *Grieve*'s teaching about the combination of cerium with noble metals in the catalyst composition of *Schaddenhorst* to reject these claims. The rejection is respectfully traversed.

Claims 66 and 67 ultimately depend from independent Claim 17, and as such each carries all of the limitations of such claim which is patentable over the cited art, as explained in the Office

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Action dated November 15, 2006. Applicant thus submits that Claims 66 and 67 are *a fortiori* patentable as well.

With respect to Claims 57 and 58, Applicant submits that neither *Schaddenhorst* nor *Grieve* teach or suggest a CO and hydrogen selectivities of 80% or greater under an operating pressure greater than or equal to 2 atmospheres as recited in Claim 56 from which these claims depend. Thus, the combination of *Schaddenhorst* with *Grieve* fails to provide all of the limitations of Claim 56 and *a fortiori* of Claims 57-58 (as required by MPEP 2143.03).

Additionally, Applicant asserts that the combination of these references does not guide the artisan to the use of the catalyst compositions recited in Claims 57-58 with the specific performance criteria at a pressure of 2 atm or more as required by these claims. As stated above, *Schaddenhorst* discloses rhodium-iridium catalysts but fails to disclose the metal catalyst material compositions recited in Claim 56 (from which Claims 57 and 58 depend). *Grieve* supplies a list of acceptable reformer catalyst compositions (see relevant passage in *Grieve* in Col. 10, Lines 22-26). However, an artisan having access to *Schaddenhorst*'s catalyst composition and having read *Grieve* would not be motivated to modify *Schaddenhorst*'s catalyst to arrive to the present catalyst of Claims 57, 58 by selecting the missing element (e.g., ruthenium in the rhodium alloy or cerium, lanthanum in the modified support) from *Grieve*'s disclosure amongst that list of acceptable reformer catalyst compositions, without some guidance from *Grieve* on how to select such element and on what the expected performance would be with the resulting catalyst composition. *Grieve* further does not offer any direction as to which of the many possible choices in catalyst materials is likely to be at least as successful by replacing iridium in *Schaddenhorst*'s catalyst composition. For example, *Grieve* does not give any indication that the combination of a ruthenium and rhodium in an alloy is more desirable or critical in a reforming catalyst. As stated in the previous Response dated October 24, 2006, there is also no mention of operating pressure in the *Grieve* disclosure, and that it can be inferred that operating at a pressure greater than or equal to 2 atmospheres is not disclosed nor envisioned by *Grieve*. Thus, the artisan does not know whether the modified compositions of *Schaddenhorst* catalyst by using some of *Grieve*'s catalyst components as suggested by the Examiner would perform well at a pressure of 2 atm or more. At best, the artisan may be tempted to try using one after another all of the possible catalyst materials listed in *Grieve* in combination with rhodium

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and for example to further select the Ce-ZTA modified alumina disclosed by *Schaddenhorst* to support the resulting alloy composition, until the use of one composition possibly would arrive at the performance criteria recited in independent Claim 56 (from which the rejected Claims 57-58 depend). However, such 'obvious-to-try' rationale is not proper without a suggestion of such combination with a reasonable expectation of successful performance.

Thus, Applicant believes that the rejection of Claims 57-58 over the combination of these two references is not *prima facie* for 1/ failing to provide all of the elements of such claims (and also of Claim 56 from which these claims depend), and 2/ failing to provide motivation for such combination with a reasonable expectation of success to arrive to the present claimed process. Applicant thus submits that Claims 57 and 58 are patentable over the combination of these references.

For at least the reasons stated above, Applicant believes that dependent Claims 66-67 & 57-58 are patentable over the combination of *Schaddenhorst* with *Grieve*. Applicant respectfully requests the Examiner to withdrawn these rejections for their immediate allowance.

### **Conclusion**

Applicant believes that this submission fully responds to the Final Office Action dated November 15, 2006. Applicant respectfully requests the entry of such claim amendment, as Applicant believes that *no new matter was introduced* by way of amendment to the claims; and that *the amendment does not raise new issues* that would require further consideration and/or search, since the pending independent Claim 17 has been allowed and the pending independent 56, in its current amended form, is also patentable since it has a narrower scope than allowable Claim 17. Applicant believes that what has been presented should be fully persuasive for allowability.

Favorable action at the Examiner's earliest convenience is respectfully solicited.

However, should there be any remaining issue which the Examiner believes would possibly be resolved by a conversation or should the Examiner would like to suggest critical language to put this application in condition for immediate allowance, the Examiner is invited to call the undersigned at (281) 293-4751 so that further delay in a Notice of Allowance can be avoided. Also, if the Examiner is not persuaded that the Application is in condition for allowance and further does not believe that whatever issues remaining can be resolved by a telephone interview, the Examiner is


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requested to at least approve entry of the amendments as they will clearly put this Application in better form for appeal by reducing issues for appeal.

Should any fees have been inadvertently omitted, or if any additional fees are required or have been overpaid, please appropriately charge or credit those fees to **Deposit Account Number 16-1575 of ConocoPhillips Company**, Houston, Texas, and consider this a petition for any necessary extension of time.

Respectfully submitted,

CONOCOPHILLIPS COMPANY - IP LEGAL



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